E-87.

MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY
UNITED STATES DEPARTMENT OF AGRICULTURE

Number 32. December, 1916.

ACTIVITIES OF THE BUREAU OF ENTOMOLOGY.

(From the Report of the Secretary of Agriculture, 1916.)

CONTROL OF INSECTS.

While all the State Experiment Stations support work in economic entomology, and while many other countries are developing services in this direction, the Department of Agriculture has by far the largest organization for the purpose of research on insect pests. It is virtually the leader of the world in the warfare against injurious insects. It has in its files biological notes on thousands of species and is studying them from all points of view in its field laboratories. No less than 143 distinct projects are being investigated at the present time, involving possibly 500 of the species of insects most injurious to crops, domestic animals, stored foods, forest products, shade trees, and ornamental plants. It is safe to say that some form of remedial treatment has been found for every markedly injurious insect in the United States, but continued efforts are being made to find something more effective or cheaper or simpler.

Many striking things have been accomplished. The pear thrips, which at one time threatened the extinction of the Pacific coast deciduous-fruit industry, is no longer feared. Two serious pests of the clover-seed crop now can be handled by slight variation of cropping methods. The bark-beetles of our coniferous forests, which have imposed a loss comparable to that resulting from forest fires, can be controlled at very little expense. Sprays and spraying machinery have been developed which can be used successfully against practically all leaf-feeding species. The fumigation of nursery stock and of warehouses has been perfected. Such injurious species as the onion thrips, the grape-berry moth, the alfalfa weevil, the tobacco hornworm, and many others of recent prominence, can be controlled. The spread of the gipsy and brown-tail moths through our Northern forests and orchards has been prevented. These injurious insects not only have been kept in a comparatively small territory, but are being reduced in number year after year by active scouting, spraying, banding, and egg destruction, and through the aid of parasites brought from Europe and Japan. Although the spread of the cotton boll weevil—which represents probably the most difficult problem in insect control—has not been stopped, the investigations of the department's entomologists have shown the Southern planter how to reduce greatly the potential damage and how to grow cotton in spite of the weevil.

An important development in this practical entomological work of recent years has been the establishment of a number of more or less temporary field laboratories, scattered over the country. Thus the expert workers are taken into the centers of activity of the injurious species. Great stress is being laid on what may be termed the cultural method of insect control. The intimate life round of the insect pest is studied in close connection with farming methods in order to ascertain whether by variation of cultural practice the insect damage can not be considerably reduced. Remedial work of this sort is extremely practical. Investigations have shown that in many instances partial or nearly complete control can be gained by some change in farm management. This naturally is the best remedy, except possibly in the case of introduced pests, where control can be secured by the employment of parasites or other natural enemies.

Technical methods of control, mechanical and chemical, including sprays and spraying machinery, fumigation for citrus orchards, nursery stock, mills and warehouses, or trapping methods and other means of mechanical destruction also have been studied and developed. In the large problems it frequently has happened that cultural, biological, and technical measures are used at the same time.

When the enormous annual losses from injurious insects are considered it is clear that the value of the department's work in applied entomology is very great.

PLANT QUARANTINES.

Important service is rendered to the farm and fruit interests of the country, under the Plant Quarantine Act, by preventing the introduction of new and dangerous insect pests and plant diseases. There are now in force nine foreign quarantines forbidding the entry, permitting the entry only under restrictions, of various farm, orchard, and forest products which may harbor injurious insects or diseases. The more important quarantines relate to the Mediterranean fruit fly, perhaps the worst fruit pest of the tropical and subtropical countries; the pink boll worm, an insect which threatens to become the most serious enemy known to cotton; the potato wart, a disease which not only destroys the tuber but infects the soil; and the white-pine blister rust and the citrus canker, two diseases which became established in the United States prior to the passage of the act.

A number of domestic quarantines also have been promulgated. Under these quarantines many locally established plant diseases and insect pests, most of them of recent origin, are being so controlled, in cooperation with the States concerned, that their extermination ultimately can be effected or, at least, their spread can be checked. These quarantines relate principally to the gipsy and brown-tail moths in New England; the Mediterranean fruit fly and the pink bollworm in Hawaii; and diseases of sugar cane in Hawaii and Porto Rico.

In some instances plants and plant products are admitted only after certification by the proper official in the originating country and the issuance of permits by the Department. They also are inspected by State or Federal experts before being released in this country. Such restrictions now apply to nursery stock of all kinds, fruits, certain plant seeds, and potatoes, and foreign lint cotton. The restrictions on cotton are designed to prevent the entry of the pink bollworm through cotton seeds which are found in all imported cotton. The cotton is subjected to fumigation in a vacuum, under supervision, by a new process devised by experts of the department.

The value of this service to the Nation is apparent. Undoubtedly many, if not all, of the plant diseases and pests mentioned now would have full lodgement or wider distribution in this country if the necessary action under the Plant Quarantine Act had not been taken to prevent their entry or to check their spread. It would be difficult to compute the resulting loss.

THE HESSIAN-FLY CONFERENCE.

A conference was held in the Bureau of Entomology December 20-21 for the purpose of discussing plans for a complete resurvey of the Hessian-fly problem throughout the wheat-growing regions of the United States. The following entomologists were in attendance: Dr. L. O. Howard, Prof. S. A. Forbes, Dr. A. D. Hopkins, Dr. A. L. Quaintance, and Messrs. W. P. Flint, E. O. G. Kelly, G. G. Ainslee, W. R. McConnell, J. J. Davis, J. A. Hyslop, G. I. Reeves, and W. R. Walton.

SAFE-GUARDING INSECT COLLECTIONS FOR SHIPMENT OR STORAGE.

[This note may be of interest to the entomologists who are unable to give personal attention to their insect collections at all times, thereby suffering the loss of some valuable specimens.]

At Wellington, Kans., on February 9, 1916, the writer tried a plan which proved to be an excellent one. A dozen Schmitt boxes of specimens were treated in the following way:

Naphthalene was melted and poured in the lids and allowed to run around the edges and harden. Carbon bisulphid was put in a small tin box lid in each box. The boxes were closed and allowed to stand over night. The next day the tins were removed and the Schmitt boxes were sealed by means of half inch white adhesive tape. The screws were loosened to allow the hooks to pass over the tape. The tape was stuck around the boxes over the junction of the boxes and lids. Each box was wrapped with paper and packed in a barrel containing excelsior. The collection was shipped to Brownsville, Texas and opened on November 23, 1916. Upon opening the boxes the writer found the specimens in as good condition after the ten months as when packed. The tape came off easily leaving the boxes clean. [Signed] T. S. Wilson.

THE SPREAD OF THE COTTON BOLL WEEVIL IN 1916.

By W. D. Hunter and W. D. Pierce.

(From unnumbered circular E-86, issued Dec. 14, 1916.)

Altogether the cotton boll weevil invaded over 71,800 square miles of territory in 1916. Only about 128,600 square miles of territory still remain uninfested in the cotton belt. Since entering the United States the weevil has averaged more than 20,000 square miles a year.

The following table shows the gains in square miles during the year 1916, by States.

Total area in square miles infested by the boll weevil in 1916.

State.	Year first infested.	Area infested in 1915.	Gain in 1916.	Area infested in 1916.
		Sq. Miles.	Sq. Miles.	Sq. Miles.
Texas	1892	182,600		182,600
Louisiana	1903	40,800		40,800
Oklahoma	1906	23,300	17,900	41,200
Arkansas	1906	31,500	9,000	40,500
Mississippi	1907	46,340		46,340
Alabama	1910	46,400	2,700	49,100
Florida	1911	13,100	7,200	20,300
Tennessee	1914	1,700	4,000	5,700
Georgia	1915	13,400	31,000	44,400
Total		399,140	71,800	480,940

The Bureau of Commerce and Navigation for 1916.
By [illegible] Washington: G. P. O., 1917.

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NOTE TO FIELD MEN.

It is desired in the coming year, that the entomological aids in the field, take a renewed and active interest in the Monthly Letter of the Bureau of Entomology.

As a medium for the interchange of ideas and opinions, or the speedy dissemination of new and interesting items, facts, devices or pertinent discoveries, the Monthly Letter has, in the past, proved its value, and the hearty cooperation of the field force, each month, through their respective offices, is solicited.

WANTED: RECORDS OF PREDACEOUS HEMIPTERA.

A card index of the predaceous species of Hemiptera, especially Heteroptera, is being established, the intention being to keep on file all records of attack by Hemipterons upon other insects in their various stages. The index will be available to anyone preparing manuscripts, parts of which deal with insect enemies. **The completeness of such a file can be greatly increased by field men sending in records of observations of attacks.** Such records should include the name of the predator, whenever possible, and the species preyed upon and in what stage. Locality and date of observation should also be given, and accompanying specimens would be appreciated. **All records should be sent to E. H. Gibson, Division of Insects, U. S. National Museum.**

LIST OF THE PUBLICATIONS OF THE BUREAU OF ENTOMOLOGY FROM JULY 1, TO DECEMBER 31, 1916.

BULLETINS, NEW SERIES:

Contents and Index to Bulletin No. 94.
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(The above indexes complete the bulletins, new series.)

BULLETINS, TECHNICAL SERIES.

Contents and Index to Technical Series No. 19.

The following are in the course of preparation:
Contents and Indexes to Technical Series Nos. 16, 17, 20.
(The issuance of these will complete the Technical Series.)

JOURNAL OF AGRICULTURAL RESEARCH.

K-38, The California green lacewing fly.
K-39, The larval characters and distribution of two species of Diatraea.
K-40, Contributions to a knowledge of the life history of the armyworm.
K-41, **Thersilochus conotracheli**, a parasite of the plum curculio.
K-42, An important Dipterous enemy of plant-lice, **Aphidoletes meridionalis.**

K-43, Effects of nicotine as an insecticide.
K-44, Life history of **Habrocytus medicaginis.**
K-45, The rosy apple aphis.
K-46, An important new insect enemy of the peach.
K-47, Observations on the English grain aphis, **Macrosiphum granarium.**
K-48, The apple-seed chalcid, **Syntomaspis druparum.**

DEPARTMENT BULLETINS:

265. Dock falseworm.
377. Argentine ant.
382. Cotton boll weevil control in the Mississippi delta.
408. Experiments during 1915 in destruction of fly larvae in horse manure.
419. The grape leaf-folder.
421. The sugar-beet thrips.
422. Eggplant tortoise beetle.
424. Cottonwood borer.
432. The spike-horned leaf-miner.
435. The apple leaf-sewer.
438. The pear leaf-worm.
443. The New Mexico range caterpillar and its control.
489. A survey of beekeeping in North Carolina.

FARMERS' BULLETINS:

740. House ants: Kinds and methods of control.
741. The alfalfa weevil and methods of controlling it.
747. Grasshoppers and their control with relation to cereal and forage crops.
752. The fall armyworm or "grass worm" and its control.
754. The bedbug.
759. White ants as pests in United States and methods of preventing their damage.
762. The false chinch bug and measures for controlling it.
763. Orchard bark beetles and pinhole borers and how to control them.
766. The common cabbage worm.

MISCELLANEOUS.

The report of the Entomologist for 1916.
Important insects which may affect the health of men and animals engaged in military operations (Circ. 61, Office of Secretary.)
The spread of the cotton boll weevil in 1916, Circ. E-86.
Distribution of the cotton boll weevil from 1893 to 1917. Large map. E-85.

LIBRARY
Miss Mabel Colcord, Librarian.

NEW BOOKS

Bestimmungs-tabellen der europäischen coleopteren Hft.79-80. Paskau, 1916. Hft.79. Tenebrionidae X. Scleronini, Microzoini, Leptodini, Stenosini, Lachnogyni.. Bearb.Edmund Reitter. (Wien.Ent.Zeit.1916, hft.V-VII, p.129-171).- Hft. 80. Tenebrionidae XI. Epitragini. Bearb. Edmund Reitter. (Entomolcgische Blatter 1916 Hft.7-9, p. 139-149)

Casey, T. L. Memoirs on the Coleoptera VII. Lancaster, Pa, New Era Pub. Co., 1916. 300p. 8' I. Further studies in the Cicindelidae. p. 1-34. II. Some random studies among the Clavicornia, p. 35-392.

Cochet-Cochet and Mottet, S. Les rosiers. Paris, 1916. 368p. illus. Maladies des rosiers: p.290-364- Insectes nuisibles p.291-336; Maladies parasitaires, p.338-364.

Congress 64, Session 2. House Document 1499. Letter from the Secretary of the Treasury transmitting estimates of appropriations required for the service of the fiscal year ending June 30, 1918. Washington, Gov't.Prtg.Off., 1916. 1041p.

Congress 64, Session 2. Official congressional directory... 1st ed. Dec. 1916. Washington, 1916. 517p.

Fuller, Claude. Observations on some South African termites. (Annals of the Natal Museum vol. III, pt. 2, p.329-504, pl. XXV-XXXV, October 1915)

Jordan, E. O. Textbook of general bacteriology. ed. 5. Philadelphia, 1916. 664p. illus.

Minnesota State entomologist. Special report... Work on the white pine blister rust in Minnesota. 1916. Nov. 15, 1916. 19p. illus. col. pl. (Minnesota State entomologist Circular 40)

Oberthur, C. Etudes de lepidopterologie comparee. fasc.11 (plates) Apr. 1916. fasc. 11 (texte) Jan. 1916.

Quebec Dept.Agr. Bulletin 23. 75p. 1916. Contents: Huard, V. A. Les principaux especes d'insectes nuisibles et de maladies vegetales.

Van Dine, D. L. The relation of malaria to crop production. (Scientific Monthly v.3, no. 5, p.431-439, illus.Nov. 1916)

Weed, C. M. and Dearborn, Ned. Birds in their relation to man. Philadelphia and London, 1916. 390p. A partial bibliography of the economic relations of North American birds. p.331-383.

BEE CULTURE
E. F. Phillips, In Charge.

A. P. Sturtevant, formerly of the Agricultural Experiment Station Staff, Amherst, Mass., began work in the Bureau on December 4. Mr. Sturtevant who will conduct the bee-disease investigations of the Bureau in the future, taking the place of Dr. A. H. McCray who is transferred to "Investigations of Insects Affecting the Health of Man," has been engaged in a study of European foulbrood for some time past in Massachusetts.

Dr. E. F. Phillips attended conventions of beekeepers as follows: Chicago Northwestern Beekeepers' Association, Chicago, on December 4; the Iowa Beekeepers' Association, Des Moines, December 5; the Minnesota Beekeepers' Association, Minneapolis,

December 6; and the Wisconsin Beekeepers' Association, Madison, on December 7-8.

Kenneth Hawkins has spent the month in South Carolina working in cooperation with the Extension Director and Entomologist of Clemson College in planning extension work in beekeeping in that State. Mr. Hawkins will probably return to Washington about January 1.

George S. Demuth attended the Indiana Beekeepers' Association at Indianapolis, November 27 and 28.

Dr. J. A. Nelson was on leave for two weeks beginning December 11.

DECIDUOUS-FRUIT INSECT INVESTIGATIONS
A. L. Quaintance, In Charge.

John B. Gill, in charge of the Bureau's laboratory at Monticello, Fla., and engaged in pecan insect investigations, has returned to Washington for the purpose of preparing manuscripts and notes on pecan insects.

R. J. Fiske has returned to Washington from Roswell, N. M., where he has been carrying out orchard spraying and dusting investigations in the control of the codling moth.

E. H. Siegler and H. K. Plank have returned to Washington from their permanent headquarters, Grand Junction, Colo., where they have been engaged in a biologic study of the codling moth and in large-scale control experiments in orchards.

H. B. Scammell, in charge of investigations of cranberry insects, with headquarters at Toms River, N. J., was in Washington during the middle of December for the purpose of consultation in regard to his work.

With the close of the calendar year the laboratory at Walnut Creek, Calif. will be discontinued. R. L. Nougaret will be stationed at Fresno, Calif., where he will continue investigations of certain points in connection with the control of the grape Phylloxera and other grape insects, especially the grapevine mealy-bug.

W. M. Davidson will be stationed at the State Insectary at Sacramento, Calif., where cooperative investigations will be carried out of predatory insects, especially Coccinellidae.

B. R. Leach has returned to Washington for the preparation of notes and manuscripts.

F. L. Simanton, in charge of the Bureau's laboratory at Benton Harbor, Mich., has returned to Washington for the preparation of reports on orchard dusting and spraying experiments.

FEDERAL HORTICULTURAL BOARD.
C. L. Marlatt, Chairman.
(In Cooperation with the Bureau of Entomology.)

Harry F. Dietz and Kearn B. Brown have been appointed entomological inspectors for the Federal Horticultural Board, the former with assignment at Washington, D. C., and the latter at New York. Mr. Dietz is a graduate of Butler College, of Indianapolis, Ind., and has served five years in the State of Indiana as an inspector. He has also worked under Prof. R. A. Cooley at the Montana State College of Agriculture for 1½ years. Mr. Brown has quite recently completed post graduate work at Leland Stanford Junior University under Professor Kellogg. For the past four months he has been teaching at the Oakland High School. Mr. Brown will supervise the disinfection of cotton at the fumigation plants at Brooklyn, N. Y., and Newark, N. J.

H. L. Sanford has been temporarily transferred to New York to supervise the disinfection of cotton until the arrival of Mr. Brown.

Harry B. Shaw, who is in charge of the New York office of the Federal Horticultural Board, has been on leave in Bermuda for the past two weeks. While in Bermuda Mr. Shaw has been devoting considerable time to the study of the plant pests of the island.

SOUTHERN FIELD CROP INSECT INVESTIGATIONS
W. D. Hunter, In Charge.

B. R. Coad and G. L. Garrison of the Tallulah laboratory were in Washington during the month.

E. L. Worsham was in Washington for a conference on December 20.

The following men are in attendance at the New York meetings: F. C. Bishopp, W. E. Dove, and Dr. Henry Fox.

U. C. Loftin will spend some weeks in Washington during the winter.

R. H. Hutchison visited New York for the purpose of investigating certain new methods of disposing of materials in which the house fly breeds.

A. H. McCray has been transferred from the apicultural section to the work on insects affecting the health of man. In connection with this trasfer he received the title of specialist in medical entomology, a new title in the Bureau. Doctor McCray will be stationed at New Orleans with Dr. W. V. King for some time in the work on malaria mosquitoes. During the spring he will be engaged in work on the Rocky Mountain spotted fever tick in Montana.

TRUCK CROP AND STORED PRODUCT INSECT INVESTIGATIONS
F. H. Chittenden, In Charge.

D. E. Fink, Scientific Assistant, stationed at the Virginia Truck Experiment Station, Norfolk, Va., is in Washington for consultation, use of library, laboratory, greenhouse, and other work.

F. B. Milliken, Scientific Assistant, has removed from 214 N. Clarence Avenue, Kans., to 220 N. Elizabeth Street, Wichita, Kans.

H. K. Laramore, who was in charge of our Station at Plymouth, Ind., and who has been a temporary field assistant for about 3 years, has resigned, his appointment having terminated.

F. M. Wadley, who has been engaged as field assistant to Mr. F. B. Milliken, Wichita, Kans., has also resigned, his appointment having terminated.

CEREAL AND FORAGE INSECT INVESTIGATIONS
W. R. Walton, Acting in Charge.

The following is a directory of Cereal and Forage Insect Investigations, January 1, 1917:

Brownsville, Tex.- R. A. Vickery, in charge; T. Scott Wilson, and Felix Garcia
Charleston, Mo.- A. F. Satterthwait, in charge; and W. H. Larrimer
Charlottesville, Va.- W. J. Phillips, in charge; and W. T. Emery
Columbia, S. C.- Philip Luginbill, in charge; A. H. Beyer and R. J. Kewley
Forest Grove, Ore.- C. W. Creel, in charge; L. P. Rockwood, J. M. Langston and Max Reeher.
Hagerstown, Md.- J. A. Hyslop and W. R. McConnell, in charge; P. R. Myers, H. L. Parker, W. E. Pennington and W. B. Turner
Knoxville, Tenn.- G. G. Ainslie, in charge; and C. C. Hill

Martinez, Calif.- T. R. Urbahns, in charge; and C. M. Packard
Salt Lake City, Utah.- G. I. Reeves, in charge; T. R. Chamberlain, P. B. Miles, S. J. Snow and L. J. Bower
Sioux City, Ia.- C. N. Ainslee, in charge
Tempe, Ariz.- V. L. Wildermuth, in charge; D. J. Caffrey, F. H. Gates, L. J. Hogg
Wakeman, O.- W. B. Hall
Washington, D. C.- W. R. Walton, (Acting) in charge; E. H. Gibson, A. B. Grahan
Wellington, Kans.- E. O. G. Kelly, in charge; C. L. Scott, Joe S. Wade, G. W. Barber and E. L. Barrett
West Lafayette, Ind.- J. J. Davis, in charge; J. M. Aldrich, C. F. Turner, F. A. Fenton, S. L. Mason
West Springfield, Mass.- Harrison E. Smith, in charge.